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3/15/11

Unit Objectives

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| 1. List reasons cell division is important for life- **knowledge**  2. Recall the importance of surface to volume ratio in cells- **knowledge** |
| 3. State the parts of a chromosome- **knowledge**  4. Recall and show the basics of the replication process- **knowledge & application** |
| 5. List and identify G1, S phase, G2, and M phase- **knowledge**  6. Summarize which events occur at each phase (cell growth, DNA replication, preparation for mitosis, mitosis)- **comprehension & synthesis** |
| 7. Identify and describe the stages of mitosis- **knowledge & comprehension**  8. Analyze the importance of each stage- **analysis**  9. Illustrate how the cell undergoes cytokinesis and its importance in cell division- **analysis** |
| 10. Recognize the different internal and external controls- **knowledge**  11. Discuss how the regulators act in the cell- **comprehension** |
| 12. Define cancer and types of tumors (benign and cancerous)- **knowledge**  13. Discuss major known causes of cancer- **comprehension** |
| 14. Define stem cell and the different cell types it can become- **knowledge**  15. Devise how stem cells grow and why they are important in the medical world- **Synthesis** |

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Cell Growth & Division Exam**

**This exam contains multiple choice, true/false, and short answer questions. Good Luck!**

*Circle your answer to the multiple choice questions below (3 points each).*

1. The rate at which food and oxygen are used up and waste products are produced depends upon: (2)

a. mitochondria

**b. the cell’s volume**

c. mitosis

d. the cell’s surface area

2. Chromosomes are made up of: (3)

a. ribosomes

b. water

**c. DNA**

d. spindle fibers

3. How many chromosomes does a typical human cell contain? (3)

**a. 46**

b. 20

c. 65

d. 100

4. Which stage of mitosis do the spindle fibers begin to form? (4)

a. Telophase

b. Metaphase

**c. Prophase**

d. Anaphase

5. Which phases make up Interphase of mitosis? (5)

**a. G1, S Phase, and G2**

b. G1, Prophase, and G2

c. S Phase, G2, and Telophase

d. G2, Prophase, and Telophase

6. In which stage of Mitosis does the cell physically split into two daughter cells? (4)

a. Anaphase

b. G1 Phase

c. Telophase

**d. Cytokinesis**

7. Timing of the cell cycle in eukaryotic cells is controlled by a group of proteins called:

(11)

a. nuclei

**b. cyclins**

c. cells

d. centrioles

8. External regulators in the cell cycle direct cells to: (10)

a. stop the cell cycle

b. have no effect on cells

c. grow uncontrollably

**d. direct cells to speed up or slow down in the cell cycle**

9. Internal regulators in the cell: (11)

a. let water and nutrients into the cell

**b. allow cell cycle to proceed only when certain processes have occurred inside the cell**

c. cause the cell cycle to stop

d. grow uncontrollably

10. When a mutation occurs on a p53 gene the: (12)

a. cell cycle stops

b. new eukaryotic cells are created

**c. cells lost the ability to respond to signals that control cell growth**

d. cell organelles lose their function

*Circle either True or False to the following questions (3 points each).*

1. **True**/False: Reproduction by mitosis is considered asexual. (7)

2. True/**False**: Centromeres are always located in the center of a chromosome. (8)

3. True/**False**: Stem cells are only found in embryos. (14 & 15)

4. True/**False**: The nuclear envelope begins to re-form during Metaphase. (4)

5. **True**/False: Embryonic stem cell research is a highly controversial topic in society. (15)

6. True/**False**: Cytokinesis works the same in both plant and animal cells. (9)

7. **True**/False: During Anaphase, centromeres join to the spindle fibers in the cell (4)

8. True/**False**: Chromosomes are normally visible in a cell. (3)

9. **True**/False: Tumors are masses of cancer cells. (13)

10. True/**False**: All tumors are cancerous. (13)

*Complete the short answer questions below (4 points each).*

1. What is Cell Division and why is it important? (1)

**Cell division is the process by which a cell divides producing two daughter cells. It produces multiple cells to increase surface area, so that each individual cell does not become too large. After mitosis occurs, cytokinesis physically splits the newly replicated cell.**

2. Name four main causes of many different forms of cancer. (13)

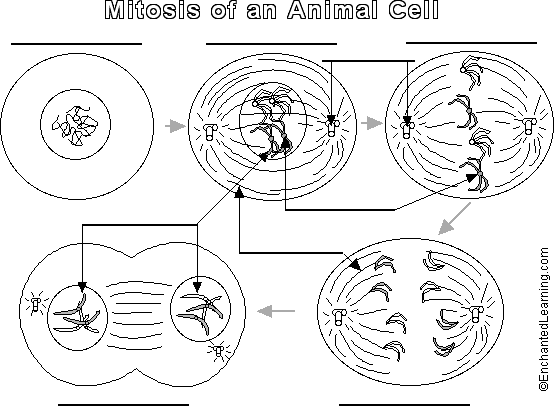
**- tanning beds - radiation exposure**

**- smoking tobacco - some viral infections**

3. Name four different types of cells in the body that stem cells can turn into. (14)

**Brain cells, muscle cells, liver cells, red blood cells**

1. Label each stage of mitosis on the pictures below.Then, describe what occurs during each stage *(15 points: 5 points for labeling the diagram & 2 points per stage description).* (6, 7, 8)

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**Interphase- G1- cell grows, organelles are synthesized.**

**S-Phase- chromosomes replicate, synthesis of DNA.**

**G2- organelles and molecules needed for division are formed.**

**Prophase- chromatin condense into chromosomes, centrioles separate, and spindle begins to form**

**Metaphase- chromosomes line up across the center of the cell, and chromosomes connect to spindle fibers**

**Anaphase- sister chromatids move apart and separate into individual chromosomes**

**Telophase- chromosomes gather at opposite ends of the cell, nuclear envelope beings to re- form around them, and cell begins cytokinesis**